



U.S. Department
of Transportation
**Federal Aviation
Administration**

Memorandum

Subject: **ACTION:** Extension of ELOS for Cabin Pressurization -
Exceedence of 15,000 Foot Cabin Altitude Limit for
Cessna Model 525B; ACE- 00-05A

Date: July 2, 2004

From: Manager, Wichita ACO

Reply to Mr. Charles Riddle
Attn. of: ACE-117W

To: Manager, Small Airplane Directorate, ACE-100

Attn:

Background: By their letter dated October 16, 2002, reference L390-01-02-3385, Cessna requested extension of ELOS ACE-00-05, for Cabin Pressurization – Exceedence of 15,000 Foot Cabin Altitude Limit to the Model 525B, reference FAA Project AT3268WI-A. The following information is taken from Cessna's letter:

1. The FAA granted an Equivalent Level of Safety (ELOS) for 14 CFR 23.841(a) for the Model 525A. Extension of the ELOS to the Model 525B is respectfully requested based on similarity of design. Where significant design changes have been made to the Model 525B, testing to justify the similarity will be performed.
2. The Model 525B operational factors and limitations that relate to the ELOS are unchanged.

Following the initial request in Cessna letter L390-01-02-3385, Cessna submitted letter L390-04-2103 dated May 26, 2004. This letter notes that the proposed design of the Model 525B was changed to include a larger primary outflow valve. Operation of the maximum altitude limiter on the secondary outflow valve on Model 525B, while mechanically identical to the secondary valve on Model 525A, is set with a separate procedure, and so has been assigned a separate part number from the Model 525A part. No other changes have been made to the cabin pressure control system. In accordance with FAA request per letter dated January 22, 2004, Cessna has carried out testing of the Model 525B cabin pressure control system (CPCS).

Cessna tested the 525B CPCS by simulating critical failures. The simulations disabled the altitude limiter on one of the outflow valves and commanded a cabin pressure dump. When the primary outflow valve altitude limiter was disabled, the cabin pressure altitude (CPA) exceeded 15,000 ft. for 4 seconds and reached a peak CPA of 15,060 ft. The CPA stabilized at 14,386 ft. When the secondary outflow valve altitude limiter was disabled, the CPA exceeded 15,000 ft. for 5 seconds, reaching a peak CPA of 15,156 ft. After returning below 15,000 ft. CPA, the on/off/on response of the automatic emergency pressurization

system allowed CPA to exceed 15,000 ft. for a second time for a duration of 3 seconds, reaching a maximum pressure altitude of 15,159 ft. The CPA then stabilized at 14,206 ft.

For comparison, when the Model 525A primary outflow valve altitude limiter was disabled, the aircraft exceeded 15,000 ft. CPA for 7 seconds, reached a peak CPA of 15,745 ft, and then stabilized at an altitude of 14,614 ft. For further details reference Cessna Letter L390-04-2103.

Applicable regulations: The Cessna Model 525B will be certified in the Commuter Category to the certification basis shown in Stage 4 of Issue Paper G-1, which is:

- Part 23 as amended through Amendment 23-54 except:
 - §23.773, 23.775, 23.933, 23.1309, 23.1311, 23.1419, 23.1441, 23.1451, and 23.1453 as amended through Amendment 23-40
 - §23.1309 as amended through Amendment 23-49 for the engine FADEC installation only.
 - Special conditions will be developed to be used in lieu of the following paragraphs of Part 23: 23.51, 23.63(a) and (d)(1), 23.67(c)(2), 23.149(d) and (f), 23.161(c), 23.173(c), 23.177, 23.201(d) and (e), 23.203(c), 23.251, 23.253, 23.1505, 23.1545, 23.1583 (a)(1), (a)(2), and (c)(4)(i), 23.1585(c)(3).
- Paragraph 5(a) of Special Conditions 23-102-SC for High Altitude Operation.
- Paragraphs 2, 3, 4, 5, and 37 of Special Conditions 23-ACE-55.
- Part 36 as amended at the time of certification.
- Part 34 as amended at the time of certification.
- Extension of Exemption 5759 from the requirements of 23.181(b).
- Extension of Equivalent Safety findings ACE-00-01, ACE-99-07, and ACE-00-05.
- Equivalent Safety Finding for §23.783(f)(1), Passenger Entry Door.
- Equivalent Safety Finding for §23.815, Aisle Width.
- Exemption to permit certification in the Commuter Category.

Regulation Requiring an ELOS: 14 CFR §23.841(a) requires (in part) that if certification for operation over 25,000 feet is requested, the airplane must be able to maintain a cabin pressure altitude of not more than 15,000 feet in event of any probable failure or malfunction in the pressurization system. The Model 525B will be certified to a maximum operating altitude of 45,000 feet.

Compensating features which allow the granting of the ELOS: See the attached copy of;

1. Cessna Letter L390-04-2103 dated May 26, 2004, Model 525B ELOS ACE-00-05 Substantiation Data.
2. ELOS memo dated June 21, 2000, which granted ELOS ACE-00-05 for the Model 525A.

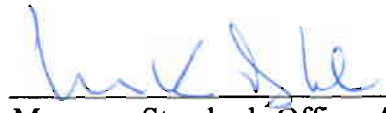
Explanation of how these features provide an ELOS: See the attached copy of Cessna Letter L390-04-2103 dated May 26, 2004, Model 525B ELOS ACE-00-05 Substantiation Data.

ACO Recommendation: The Wichita ACO has reviewed the information presented in Cessna Letter L390-04-2103 dated May 26, 2004, Model 525B ELOS ACE-00-05 Substantiation Data, and the ELOS memo dated June 21, 2000, which granted ELOS ACE-00-05 for the Model 525A, and concurs that it is appropriate to extend ELOS ACE-00-05 to the Model 525B.

Signed by G. M. Baker July 8, 2004

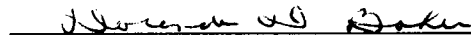
Gerald M. Baker, ACE-115W
Manager, Wichita Aircraft Certification Office

Concurrence:



Manager, Standards Office, ACE-110

7.22.04
Date



Manager, Small Airplane Directorate, ACE-100

7/27/04
Date